

HP Professional

JULY 2000

Servers

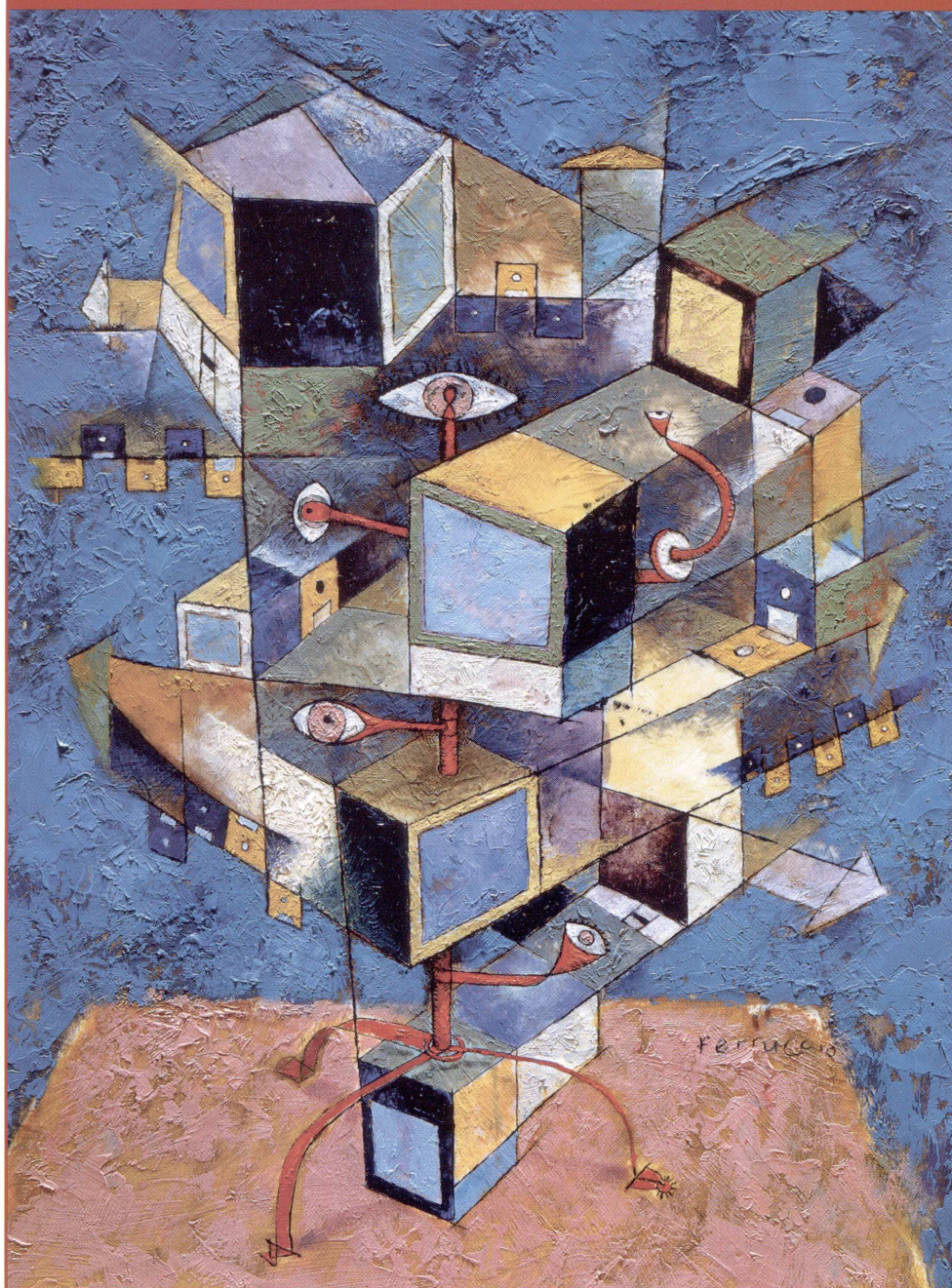
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HP ENTERPRISE SERVERS



A Tale of Two Servers

HP 9000 Evolution

Low-End and
Midrange Offerings

HP NetServers

Intel-Based Boxes
That Pack a Punch

Three OpenViews

HP-UX Admin Man

Service Control Manager

On the Server Side

Help Utilities for
Win NT and 2000

HP e3000

The Phoenix Program

Guest Editorial
Winston Prather,
CSY GM, on the
HP e3000



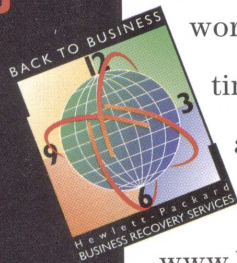
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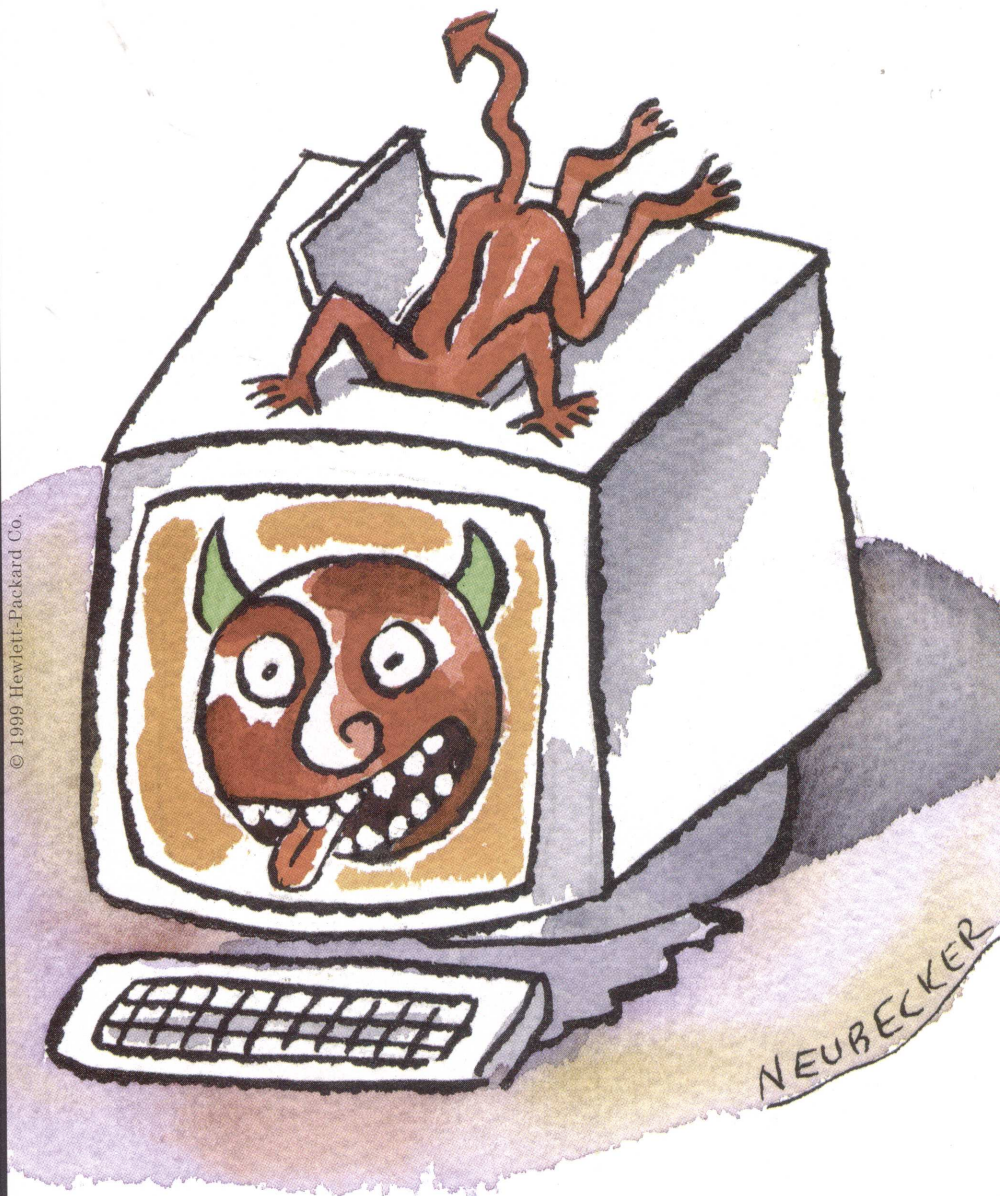
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HP 9000

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The year 1999 was a transitional one for HP, in which the computing giant sharpened its overall focus on information technology, and a year in which the computing giant came to terms with several of its most crucial missteps over the course of the two previous years. HP looked to flush out its entry-level and mid-market HP 9000 server offerings, and, as a result, the company ended up promoting a variety of different low-end and midrange offerings. **By Stephen Swoyer**

HP NETSERVERS

12 HP NetServers Overview: Intel-Based Boxes That Pack a Punch

Intel-based servers have penetrated small business, the workgroup, the department, the enterprise and they're widely used by service providers. HP's Intel-based servers – its NetServers – get high marks, partly because HP was a pioneer in the Intel-based server space and partly because of the high-availability and management features HP has integrated into the midrange, as well as the high end of the product line. **By Jean Nattkemper**

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Enterprise system management is such a hot topic, and HP OpenView such a dominant player in this space, that third-party vendors are integrating their products with OpenView, extending its functionality. Agilent Technologies, OPNET Technologies and Network Appliance are among the vendors that have recently introduced new, integrated solutions. **By Jean Nattkemper**

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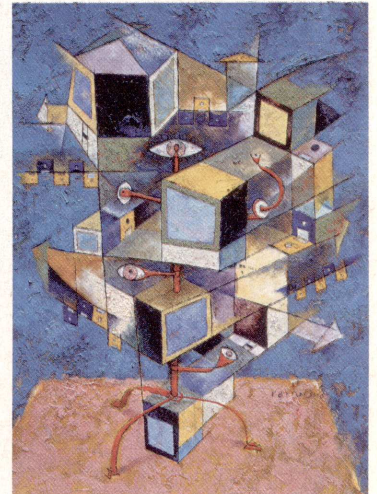
This month, Fred covers another free product from HP – Service Control Manager (SCM). You could say it is remsh, sudo, rdist, shutdown.allow, SAM and all the other setuserid-type tools rolled into one. **By Fred Mallett**

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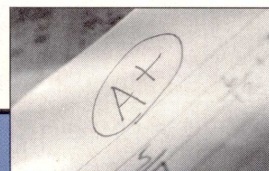
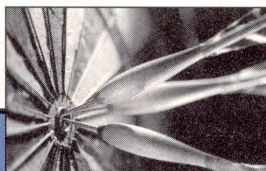
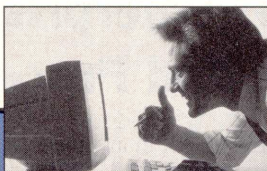
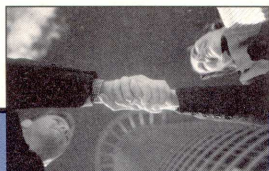
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The HP e3000: Enterprise Server or Back-End Processor?

Those familiar with the HP e3000 envision it in its historical role – as a rock-solid, heavy-duty OLTP workhorse. In many shops, the e3000 still fulfills the role of a back-end server, connecting to other platforms in a heterogeneous environment. There's more to the story, though.

The Internet was unheard of when the HP e3000 first shipped. Today, the e3000 is an Internet-enabled e-commerce platform.

That doesn't mean you'll see the e3000 running some of today's blockbuster ERP applications. The applications it does run, though, have been highly tuned for the system, and some of them move it right into the e-commerce world. Take, for example, Smith-Gardner's Ecometry, an e-business application suite that offers front-end customer relationship management applications integrated with back-office e-fulfillment capabilities. Ecometry running on the HP e3000 is moving order catalog businesses to the Internet.

As a matter of fact, the HP e3000 shines in vertical markets. Think of credit union applications from SUMMIT Information Systems or healthcare applications from HBOC that are tuned for the e3000. The e3000 has performed so successfully in these markets that we are targeting additional verticals.

Then there are apps-on-tap. Here the e3000 not only serves vertical markets, but is delivering e-services. CSY virtually pioneered the apps-on-tap model at HP by running the OpenSkies airline passenger reservation systems on e3000s located in HP data centers – at a transaction-based fee that amounts to just cents per use. Telenomics and HP followed up on that by delivering Telenomics' PWARE telephone management software on an apps-on-tap basis, as well.

The HP e3000 has come a long way. The Web didn't exist when the first HP e3000 rolled off the line. Now, with the release of MPE/iX 6.5 and the bundling of the Apache software, the e3000 can act as a Web server. The Secure Edition of Apache, the first in our Webwise suite of technologies and products for the e3000, features full RSA encryption and SSL (Secure Sockets Layer), giving it Internet-strength security. Users can build intranets and extranets, as well as run e-commerce applications right on the HP e3000.

Whether the e3000 is a back-end OLTP processor or a front-end server running Internet applications the ability to operate across platforms is essential. That's why we offer message-oriented middleware (MOM) to allow the e3000 to access different computing platforms and networks. MOM solutions for the e3000 include Level 8's Geneva Message Queueing, which allows Windows to interact with other applications, Willow Technologies' IBM MQ Series and premier Software's Active Web.

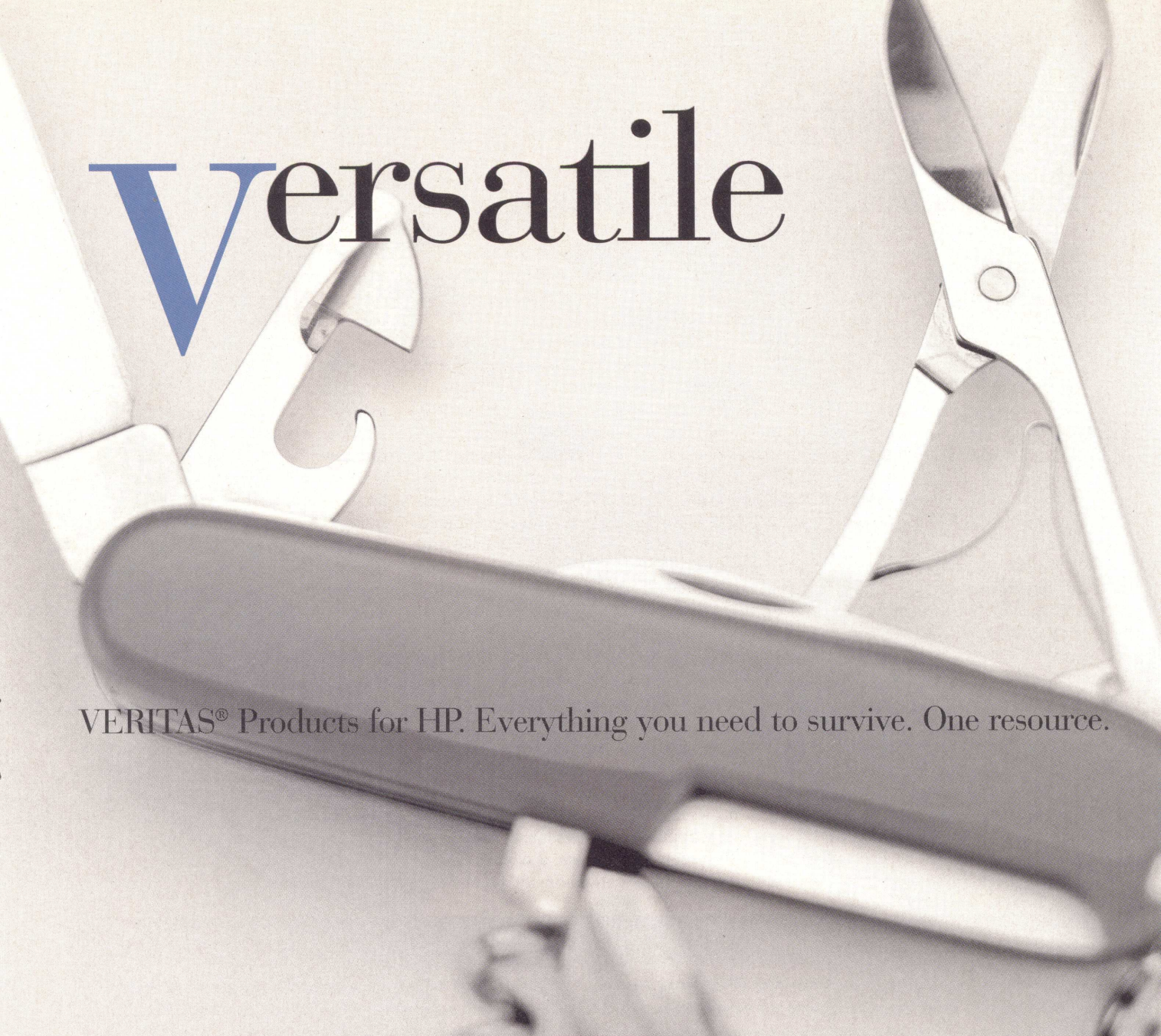
The e3000 also offers industry-standard database connectivity. The HP Driver for JDBC (Java Data Base Connectivity) facilitates development of Java applications and applets, while the ODBC (Open Data Base Connectivity) API enables connectivity between Windows applications and IMAGE databases.

We've also simplified the learning curve for new MPE operators and managers. Today, e3000 users can point-and-click their way around the system using full GUI management tools, such as GUI3000 from OmniSolutions or Starman from Bradmark; database management tools, such as Robelle's Supertool; and integrated development environments, like Whisper Technologies' Programmer Studio. Users can also move VPLUS legacy applications forward with full GUI support using new technologies, such as Millware Corporation's ScreenJet product or VPLUS+ from Advanced Network Systems.

This spring, we renamed the 3000, adding the "e" to emphasize that the e3000 is, as I said at the time, "a true Internet platform." Any way you look at it – back-end OLTP processor or front-end server – the HP e3000 is Internet-ready, in terms of its Internet-enabling technologies and its ability to communicate with different platforms and different databases.



– Winston Prather, General Manager
HP's Commercial Systems Division (CSY)



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HP'S STORAGE STRATEGY

HP has become a real player in the storage arena. A little more than a year ago, it was still considered a captive supplier of products to HP-only environments, or as a reseller for EMC. Now, it has racked up sales of more than 2 petabytes of storage for high-end storage platforms, says Bob McGraw, Brand Marketing Manager for HP's Storage Organization (HPSO). According to IDC, HP now ties EMC in market share, capturing a bit more than 12 percent of the total terabytes of disk storage shipped worldwide. That percentage exceeds IBM's, and represents almost twice that of Sun.

HP's storage announcements just keep coming. In mid-May, the company unveiled new products for the high end – new functionality for Zero Downtime Backup and a new NAS product. At the same time, HP announced a new SureStore E Tape Library 6/140 and a SAN backup solution.

The new functionality for the HP SureStore E Disk Array XP256-based Zero Downtime Backup solution from HP OpenView OmniBack II is available on Windows NT for Microsoft Exchange and file systems applications and on HP-UX for Oracle Parallel Server, as well as for Oracle, SAP R/3, file system and raw disk. HP

also announced that the new solutions integrate with VERITAS NetBackup with Business Copy XP across the same platforms. For NAS, HP is offering pre-packaged NAS solution templates and has expanded its services.

HP's new HP SureStore E Tape Library 6/140 is a modular tape library available in four- to six-drive configurations. It offers slot capacities of 100, 120 or 140, and both SCSI and Fibre Channel interfaces. The 6/140, currently offering DLT 8000 drive technology with native capacities of 4 TB, 4.8 TB and 5.6 TB, is upgradeable to include new tape drive technology, such as HP's Ultrium format LTO and Super DLT tape. SAN backup, a pre-tested SAN backup solution for heterogeneous servers, will support HP-UX, NT and Solaris servers this month.

These announcements come on the heels of a number of other storage announcements from HP. Less than a week before, HP unveiled SureStore E Command View XP and OpenView SPI for XP Disk Arrays. Command View XP deploys a platform-independent Web browser interface to give users a broad view of their storage resources. OpenView SP for XP Disk Arrays, a storage device management extension for OpenView

environments, allows customers to monitor their XP storage devices from a single console and integrate them into HP OpenView's service level management tools. And not long before those announcements, HP introduced a new high-performance entry-level disk system (the SureStore E Disk System HVD10) that operates on both the HP-UX and MPE platforms, while also announcing it had increased the capacity of the FC60 to feature new 73-GB drives.

HP is also bringing the two major parts of its storage operations, as well as smaller storage groups under a single umbrella – HPSO. The new group is divided into five main units: data protection (tape libraries and formats), data management (disk systems, arrays, and direct attached storage, including NAS and SAN), extended platform (the high end, including high-end arrays and XP storage management software), networking (Ethernet hubs and switches) and integrated solutions (including SAN infrastructure and storage management software that is not device-specific). Networking was pulled under the general storage umbrella because HP "believes storage networking is where things are going, and we're focusing on both NAS and SAN," explains McGraw.

HP Unveils UNIX Servers

HP, second behind Sun in the entry-level UNIX server market, made a bid to move up by launching the new A-Class, the HP 9000 A400 and A500. HP is also bundling some big-name software with the A-Class, having lined up more than 20 ISV partners. To meet the needs of service providers and start-ups, HP has extended its existing instant Capacity on Demand (iCOD) program and its innovative financing options.

The new 1- or 2-way A-Class servers are available on Linux and HP-UX and fall below the entry-level 4-way L-Class, reflecting HP's desire to further penetrate the entry level – a lucrative market that reaches almost \$11 billion, according to IDC. Specifically, HP is targeting Internet start-ups, established dotcoms, and enterprise and mid-market customers evolving from brick-and-mortar businesses to e-businesses, says John Miller, HP's Worldwide Product Line Manager for UNIX server systems.

The A400 features HP's PA-8500 chip; the A500 features the PA-8600, the new processor included in HP's mid-range N-Class. The servers also feature

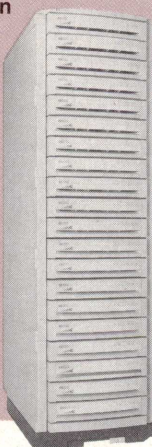
WebQoS peak traffic management software, extended fault management systems and Web-based management tools for remote diagnosis.

Bundled with both servers are Nokia's WAP server, Infoseek's search engine, and Resonate's load-balancing software. The Nokia software makes the A-Class the first out-of-the box wireless Web server, according to Miller, who says it was included to meet the growing demand for access into databases and Web front ends via cell phone or mobile device.

To meet the needs of service providers, HP has extended its instant iCOD program to offer Servers on Demand. The Servers on Demand program allows businesses to keep HP servers on-site and increase capacity as they need it, paying only as they pull the servers into their environment.

The new Pay-Per-Forecast program allows users to structure their payments based on forecast over the term of the lease.

For more on HP's 9000 series, see "The HP 9000: In a Class (or Is That Classes?) by Itself" on page 9.



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The Buzz

F5 LOAD-BALANCING APPLIANCES

E-commerce and the demand for bandwidth have made load-balancing solutions, like those from F5 Networks, hot products. F5's load-balancing appliances – software integrated with server hardware – even out loads over multiple servers.

Now F5 has expanded its BIG-IP family of products by unveiling four new special-purpose iTCM (Internet traffic and content management) appliances. Three of the four products provide load balancing and high availability for a specific type of network device – firewall, Web and cache servers. The fourth handles SSL encryption and centralizes SSL traffic management to enhance speed and traffic management for secure online transactions.

The new products include BIG-IP Fire Guard, which provides load balancing and high availability for firewalls; BIG-IP Load Balancer, which provides load balancing of Internet servers; BIG-IP Cache Controller, which provides load balancing and high availability of cache servers, and BIG-IP e-Commerce Controller, which manages SSL

encryption and centralizes SSL traffic management. The first three appliances will begin shipping in the second quarter of this year. The fourth, BIG-IP e-Commerce Controller, will begin shipping in the third quarter.

LOUDCLOUD'S NEW PORTAL

Loudcloud, a service provider led by Netscape founder Marc Andreessen, has launched myLoudcloud, a new portal that gives the company's customers detailed information about their Web sites. Using a secure Internet connection, any Loudcloud customer can access realtime application infrastructure performance statistics and detailed Web site traffic reports. The portal can be personalized to fit customer needs and is available now.

"myLoudcloud gives us access to detailed data about the performance of our systems in realtime, even though Loudcloud is handling the management and hosting of our infrastructure," says Chris Wong, CEO and President of SkillsVillage.com. "The portal also provides us with valuable information about the cus-

tomers that are visiting our Web site, and what areas are catching their interest."

The new portal is part of Loudcloud's Smart Cloud services, packaged "pay-as-you-go" Web-based business services, which include storage and networking equipment, software, bandwidth for online access, and around-the-clock operation and technical support. Launched in February, Loudcloud offers different price structures for services, based on clients' needs, and targets companies that already have an Internet presence and venture capital backing.

The startup has lined up some industry heavyweights as partners, including HP, Sun and Oracle, to offer customers bundles of hardware, operating systems, Web servers and e-commerce applications. The company is also working with hosting partners GlobalCenter and Exodus to support its customers' sites.

BRADMARK & SUMMIT TEAM UP

Bradmark Technologies and Summit Information Systems have partnered to provide an automated back-office solution for businesses running Summit's credit union system on HP e3000s. The solution integrates Bradmark's WinMPE/Command Center with Summit's Spectrum full-share, loan and general-ledger account package. WinMPE allows system administrators or operators to perform the majority of tasks on an HP e3000 from a Windows GUI environment.

"Basically, what this integration does is give HP e3000 users running Spectrum a GUI interface and system management tool for all the back-office effort and implementation they would normally do in a command line situation," says Mark Mitterlehner, Bradmark's Vice President of Sales. "We're replacing the command line with something user friendly. This should allow ... people who do not know MPE well to still manage an HP e3000 on the back office."

Bradmark has also tweaked WinMPE for the Spectrum software. "Working with Summit, we've changed some features in our standard product and changed some of the look and feel to match their needs," Mitterlehner says. "In other words, we've customized WinMPE, so that it deals with the Spectrum system very well."

Bradmark also plans to integrate WinMPE with other major applications and even some of the smaller ones that run on the HP e3000. "This is the first of many announcements involving integrating of WinMPE with other apps," Mitterlehner says. ♦

Industry Forms B2B Exchange

Twelve industry heavyweights have stunned the industry by setting aside their rivalries and announcing they will launch an independent company that will serve as an Internet exchange. The participants include AMD, Compaq, Gateway, Hitachi, HP, Infineon, NEC, Quantum, Samsung, SCI Systems, Solectron and Western Digital.

The new venture will address supply chain inefficiencies in the computing and electronics-related industries by providing end-to-end services that are open and available to all parties in the supply-chain process – consumer and business electronics makers, contract manufacturers, suppliers and distributors. "The creation of such an exchange can improve supply-chain efficiency tremendously through cost reduction, timely transactions, inventory savings and high-value services," says Dr. Hau Lee, Professor of Operations, Information and Technology at Stanford Business School.

The founders initially expect to sink \$100 million into the new company and will share equal ownership. That requires only a modest investment from each of the companies, which aim to take advantage of a big opportunity. They say \$600 billion in high-tech components and parts will be sold online over the next few years. The companies also intend to take advantage of another opportunity presented by the exchange – the chance to reduce their own supply chain costs by using it to manage many of their own e-procurement purchases and sales.

The companies have established four goals for the exchange:

- a reduction in manufacturing and purchasing transaction costs through process efficiencies
- a reduction in inventory levels throughout the entire supply chain by better matching supply and demand via the online marketplace
- increased customer satisfaction due to faster service delivery
- provision of expertise on supply chain "best practices" to help participants achieve better results from product design to customer delivery

The exchange, expected to be operational within 90 days, is welcoming additional founding members during that time. IBM announced that it will partner with at least nine companies in the electronic industry to create its own B2B exchange.

The HP 9000

In a Class (or Is That Classes?) by Itself

Stephen Swoyer

The year 1999 was a transitional one for HP in which it sharpened its overall focus on information technology. It was also a year in which the computing giant came to terms with several of its most crucial missteps over the course of the two previous years, not the least of which involved its bungling of a once-stellar UNIX products and services portfolio.

Beginning in 1999, HP looked to flush out its entry-level and mid-market HP 9000 server offerings to counter Sun's incursion. As a result, the computing giant ended up promoting a variety of different low-end and midrange offerings.

A-CLASS

In September 1998, HP plugged a glaring hole in its product family with the release of the A-Class series of single- and dual-processor HP 9000 UNIX servers.

With the A-Class, however, HP fired a shot directly across Sun's bow. For space-conscious ISPs and for other organizations, HP touted the fact that 20 of its A-Class servers were capable of fitting into a 2-meter rack. Moreover, the A-Class' nice price tag – less than \$5,000 – made it a veritable bargain, as far as RISC-UNIX solutions are concerned.

Because they were targeted toward Web site hosting environments and engineered for Internet-specific applications, the HP A-Class servers also incorporated new secure Web console and Web quality of service (QoS) technologies from HP. The secure Web console feature, in particular, facilitated full system remote control from a Web browser interface. HP's QoS software – dubbed WebQoS Peak – was said to stabilize Web site performance and improve transaction throughput.

And to compete with Sun Microsystems in larger service provider environments, HP debuted another new server family – the R-Class – that was engineered specifi-

cally for large ISPs and for other customers that required high performance, entry-level systems with rack-mounting capabilities and additional room for expansion.

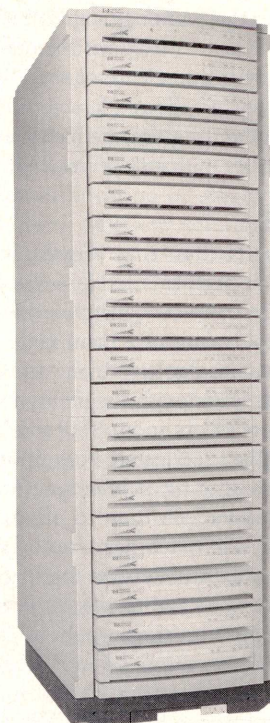
According to Ram Appalaraju, Director of Marketing for HP's UNIX operating system business unit, the company's A-Class HP 9000 servers have helped to make it competitive in a vital marketplace. Throughout 1998 and for part of 1999, Appalaraju points out, competitors bottom-fed on HP's soft underbelly: The low-end UNIX server space.

"One of the things that really hurt us in 1998 and early in 1999 is the fact that we didn't have a competitive low-end offering," Appalaraju says. "It wasn't so much our UNIX business overall, because in the midrange we were still the leader. When the market volume was growing in the sub-\$100,000 or sub-\$50,000 space, we didn't have anything to offer."

L-CLASS

For IT organizations that require a beefier UNIX platform with more than two processors, HP also markets the L-Class series, which comprises intermediary systems of one to four processors that are positioned as steppingstone alternatives to the low-end, application-specific A-Class series and the scalable, brawny L- and N-Class lines, which are marketed for transaction processing and for enterprise application hosting.

For its part, the L-Class is positioned primarily as an application server platform. To that end, today's L-Class boxes ship in a mid-sized formfactor – 7U, compared with the 2U height of A-Class servers and the 10U formfactor of N-Class systems – and can be fitted with up to 16 GB of memory and 256 GB of internal storage. Like their entry-level A-Class brethren, L-Class servers feature HP's Secure Web Console capability, but also include a built-in fault management system for fault detection and



avoidance. HP also bundles its WebQoS software with the L-Class server family.

K-CLASS

The next step up from the L-Class is HP's K-Class series of UNIX servers, which are positioned either for enterprise or for technical computing environments. Available in a variety of processor configurations – ranging from PA-RISC 8200 to PA-RISC 8600 processor models – K-Class boxes can scale from one to six processors, can address up to 8 GB of physical memory, and can support up to 30 TB of storage.

N-CLASS

Based on HP's latest-and-greatest PA-RISC 8600 microprocessor, the N-Class family of HP 9000 UNIX Servers is HP's brawniest midrange contender. Scaling from one to eight processors and capable of addressing up to 32 GB of physical memory, N-Class servers can also support up to 71 GB of external storage. HP sees the N-Class series as a midrange performer that approaches near-mainframe performance. The company positions the N-Class as a solution for a variety of tasks, from high-end OLTP to MRP to ERP. N-Class servers feature HP's Secure Web Console capability, built-in fault management system and WebQoS software.

According to HP's Appalaraju, the release of the N-, L- and A-Class servers

helped to shore up his company's deficiencies in the midrange server space.

"Our holes in the midrange were plugged with the release of the N-Class, the L-Class and the A-Class servers," he comments, noting that demand remains brisk for HP's midrange server line.

V-CLASS

While the N-Class may approach near-mainframe performance in some areas, HP's V-Class servers constitute the UNIX world's equivalent of a mainframe. With near-linear scalability from one to 32 processors – and with the ability to scale to 128 processors in an SMP configuration – V-Class servers are built upon HP's scalable computing architecture (SMP).

For standard SMP up to 32-way systems, V-Class machines employ a uniform memory architecture topology. For 32-way systems and above, however, V-Class servers leverage cache coherent non-uniform memory architecture (CCNUMA), a topology that proposes a number of nodes linked by HP's high-speed "hyperfabric" interconnect.

"We'll scale up to 32-way SMP systems in a single cabinet, and in this case all of the CPUs have equal access to the memory," Appalaraju explains. "For configurations of up to 128-way, we use CCNUMA, and this is what we call our scalable computing architecture."

In designing its HP 9000 server line, HP's Appalaraju comments, his company leveraged a three-prong strategy: "What we've done with the HP 9000 family is really a three prong evolution," he contends. "First, we've made the processors a lot faster, to where they're able to perform more than two billion operations per second; also, we made the interconnects a lot faster on all of our machines; and third, we've provided the native ability to cluster any of these machines – A-Class, L-Class, N-Class or V-Class – purely from a hardware perspective."

LONG-TERM FUTURES

When HP ships its first HP 9000 servers based on the forthcoming PA-RISC 8700 processor, customers can expect additional increases in scalability and performance.

While HP's current PA-RISC 8600 processors top-off at 552 MHz, the new PA-RISC 8700s are expected to debut at operating frequencies of 800 MHz and above. When it ships, the PA-8700 will be based on an .18 micron, silicon-on-insulator copper CMOS process,

The HP-UX 11i: The Workhorse for the Internet Age

HP is expected to ship its next-generation HP-UX 11i operating system sometime this summer. When it appears, HP-UX 11i will mark the long-awaited revamping of HP's venerable workhorse UNIX operating system for the Internet age.

According to Ram Appalaraju, Director of Marketing for HP's UNIX operating system business unit, HP-UX 11i extends HP's traditional core competency.

"We didn't jump on the Internet bandwagon immediately, we took a little bit of a lag time to take a look at the market. We wanted to make sure that we could bring those [availability and reliability] to bear in the Internet space."

The support of independent software vendors (ISV) is always crucial to the acceptance of any new operating system. Preparatory to the release of HP-UX 11i, then, HP set about recruiting a host of Internet-specific ISVs to support its next-generation operating system platform.

"We pretty much had all of the major ISVs that we needed in the online transaction processing, OLAP data-mining, financial and telecommunications sectors," he acknowledges. "What came next was the Internet-centric ISVs, and the good news is that we're really making tremendous progress in that area, and more than 55 new Internet-specific ISVs have ported their applications onto HP-UX in the last six months."

In addition to 100 percent binary compatibility with HP-UX 11.0, HP-UX 11i will ship with a raft of new amenities. HP-UX 11i will provide native support for Web quality of service; for Web traffic and Web throughput analysis; and will ship with OEM products from HP partners, such as the UltraSeek search engine from InfoSeek. HP is also bundling additional software – such as the iPlanet LDAP server from Netscape and Sun's joint venture iPlanet – with HP-UX 11i.

HP-UX 11i's availability and scalability features will include augmented support for hot-swappable devices, enhanced I/O performance, optimized Java performance and a tunable operating system kernel.

HP UX 11i will feature a more granular focus on security, expanding upon its predecessor's IPSEC and VPN support with the addition of an integrated intrusion detection software tool, dubbed IDS 9000. HP-UX 11i is expected to support a variety of enterprise authentication protocols, including LDAP, Kerberos 5, NTLM and NIS+.

And while he says that his company has no plans as of yet to support Linux natively on its HP 9000 servers, HP's Appalaraju claims that HP-UX 11i will include full support for Linux APIs.

"The APIs allow you to take the Linux code and recompile it," he explains. "The API compatibility allows for ease of porting to move the applications onto HP-UX 11i."

–S.S.

which HP claims allows for up to 2.25 MB of on-chip cache.

Both HP-UX 11 and HP's forthcoming HP-UX 11i release will run out-of-the-box on the PA-RISC 8700. Moreover, both operating systems will also run unaltered on Intel's Itanium microprocessor, which is expected to debut in the second half of 2000. Consequently, HP will leverage a marketing strategy that attempts to exploit Itanium as a platform for entry-level high-performance computing applications, and the PA-RISC 8700 on the high-end.

"[Itanium] is a brand new architecture, but there are still some questions associated with it, especially the issue of how much of the processor's capability can be translated into performance," acknowl-

edges HP's Appalaraju. "Clearly, there's going to be huge excitement around Itanium, and we will support it with all of our major OSes, including HP-UXi, Windows 2000 and Linux."

Rob Enderle, a senior analyst with Giga Information Group, says that HP's dual-headed PA-RISC and Itanium strategy could prove to be a potent one-two punch in both the low- and the high-ends of the enterprise computing marketplace. More importantly, Enderle cautions, a vendor, such as Sun – which has not yet committed to an Itanium strategy – could find itself in trouble. ♦

– Stephen Swoyer is a journalist, specializing in UNIX and NT (2000). He can be reached at swoyerse@yahoo.com.

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HP's NetServers

Intel-Based Boxes That Pack a Punch

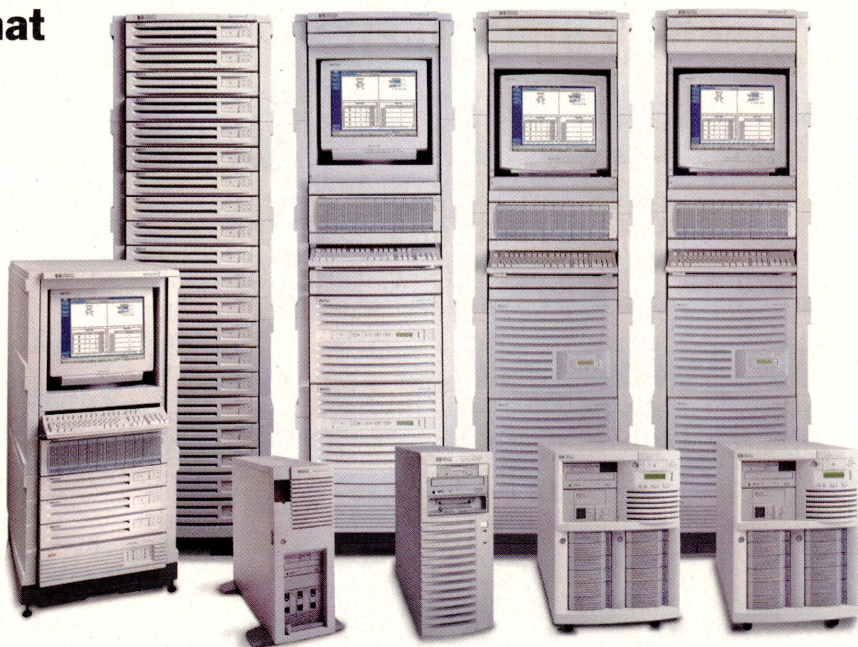
Jean Nattkemper

Intel-based servers have penetrated small business, the workgroup, the department, the enterprise, and they're widely used by service providers. Sales of these systems have surged, as improvements in hardware have allowed Intel-based servers to rival the performance of entry-level UNIX-based machines, and as users have grown comfortable enough with Windows NT to trust it with their mission-critical applications. The introduction of Windows 2000 has further spurred demand. Now, even high-end users are migrating down to Intel chips because of Win 2000's promised scalability.

HP's Intel-based servers – its NetServers – get high marks, partly because HP was a pioneer in the Intel-based server space and partly because of the high availability and management features HP has integrated into the midrange, as well as the high end of the product line.

"It's fair to say we were out in front in the NT server space," says Chris Bennett, Product Marketing Manager at HP's Network Server Division. "We've also brought high availability and high-end features very aggressively into the midrange of the portfolio. Take, for example, our LH 3000. We included features like a dual-channel integrated RAID controller, a hot-swap fan and N+1 power supplies."

HP took on a pioneer role again this March, when it introduced the LH 6000 and LT 6000r servers, 4-way machines that can scale up to six processors. The LT 6000r, a rack-optimized machine with a small form factor, has become so popular it's now considered the flagship of the entire NetServer line. That line reaches down to the entry level and up to what HP calls its "superserver."



THE E 60 AND LPr

At the low end of the NetServer line are the E 60 and the LPr, a rack-optimized server. The E 60 is the newest in the original E series, pioneer NT boxes for small business. The E 60 is designed to provide a small business with everything it needs. Sold to floral shops, dentists and businesses with sole proprietors, the E 60 meets general needs for file serving and Web access.

The E 60 is a 2-way server and supports Pentium III 500-MHz, 550-MHz and 600-MHz chips. It offers up to 1 GB of memory and comes with HP TopTools, the Web-based tool for managing Windows boxes and devices on a network. The E 60 also features an integrated backup solution (see Table 1 on page 14).

Priced at the cost of a relatively inexpensive desktop, the E 60 can be purchased for less than \$1,500.

The LPr, an innovative product when it was introduced 18 months ago, is a 2-way in a rack-optimized 2u form factor. "The growth rate for that format is tremendous," Bennett says. Demand is being

fueled by ISPs, ASPs and other kinds of service providers, who often install 15 or 20 LPrs in a rack. But sales are not limited to service providers. Corporate users who want to deploy a proxy server, cache device or reverse proxy adopt the LPr to obtain significant functionality without sacrificing much space.

The LPr packs a lot of punch in a small space and boasts a relatively low price tag, selling for about \$3,500 to \$4,000.

The demand for the LPr reveals a broad new trend in the industry – toward rack-optimized boxes. Three or four years ago, such machines didn't even exist. Now, Bennett says, even users purchasing multi-purpose machines, like the LC 2000 and 3000, frequently choose rack over pedestal models. Rack-optimized models are essential for service providers, of course, who must conserve space, but Bennett thinks there's another reason for their popularity – external storage arrays. With external storage arrays, users can obtain what they want from a box – essentially a boot drive and a mirror boot drive – and then might purchase a machine like HP's XP256 disk



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array, which offers terabytes of storage, or HP's FC60, which stores up to 60 drives, and more than a terabyte of storage.

THE LC 2000

At the low end of HP's multipurpose NetServers is the 2-way LC 2000, introduced in November 1999. It is available in a pedestal and a 5u rack-optimized version (the LC 2000r). The rack-optimized version is embraced by remote sites that are implementing an entire infrastructure and want to put a hub, switches, UPS, and so on, into a small rack to save space.

Because it is a remote office server, the LC 2000 features easy manageability, from the standpoint of both physical and networking management. Color-coding of components and descriptive labels help non-IT personnel service the boxes. Remote management is built-in so that personnel in a corporation's central office can connect over a phone line and control the server as completely as though they were sitting next to it.

"Actually," Bennett says, "a lot of corporate customers buy them and use them as auxiliary devices in data centers, even though they're considered departmental servers."

The LC 2000 supports up to two 800-MHz processors and up to 4 GB of memo-

ry. It offers a full suite of high availability features – redundant, hot-swappable components, including power supplies and fans. The LC 2000 sells for about \$2,300 or \$2,400.

THE LC 3000

Introduced at the same time as the LC 2000 late last year, the LC 3000 proves there's a substantial market for a 2-way application/file server. Targeted at departments where there are hundreds of LANs, the LC 3000 can run an entire application out of the box. In fact, the HP Network Server Division, a group with 900 employees, runs its Microsoft Exchange server off an LH 3000. That, says Bennett, is "a classic application for this box."

With the LC 3000, departments "can use up to 12 hot-swap drives, put a big tape drive inside the system, and upgrade all the way up to the 6000 series machines," Bennett explains. "The LC 3000 also features a full suite of high availability features, including kind of exotic things like hot-plug PCI." It also features an integrated dual-channel HP NetRAID Controller that outperforms HP's stand-alone PCI RAID controller. "We sell the PCI RAID controller for about \$2,200," Bennett says. "The high-performance

RAID controller soldered into the LC 3000 comes at no additional charge."

The LC 3000 supports up to 800-MHz Pentium IIIs, up to 4 GB of memory and comes with hot-plug drive bays and redundant power supplies. It comes in a rack-optimized version, the LC 3000r, with an 8u form factor. Pricing starts at about \$3,500.

THE LH 4 AND LH 6000

In the high-performance midrange area, the NetServers shine, which is good news for HP, because 4-way boxes account for the bulk of IT spending on NT/Win 2000 servers and are the biggest revenue and margin generators for PC server vendors. The 4-way market is expected to double in 2001 and grow 50 percent a year for the next couple of years, according to IDC.

HP's LH 4 is the best-selling 4-way in the industry, but it has been replaced in functionality and price/performance by the company's newest NetServers, the LH 6000 and LT 6000r. Although HP will enable people using the LH 4 to continue to buy it, the company expects new customers or those deploying new applications to choose the 6000 over the 4000.

The LH 6000 and LT 6000r are 4-way/6-way servers, capable of scaling up to six Pentium III Xeon processors. This

	E 60	LC 2000/2000r	LPr	LH 3000/3000r	LH 4/4r	LH 6000/6000r	LT 6000r	LXR 8500
Microprocessors	Pentium III 550 MHz/550 MHz/600 MHz	Pentium III 533 MHz/600 MHz/667 MHz/ 733 MHz/800 MHz	Pentium III 500 MHz/ MHz/700 MHz	Pentium III	Pentium III Xeon 500 MHz/550 MHz/700 MHz	Pentium III Xeon 500 MHz/550 MHz/700 MHz/800	Pentium III Xeon 500 MHz/700 MHz/ 800 MHz	Pentium III Xeon 550 MHz/700 MHz/800 MHz
Max. processors	2	2	2	2	4	4	6	8
Memory Standard Max	64 MB 1 GB	128 MB 4 GB	64 MB 1 GB	128 MB 4 GB	256 MB 4 GB	256 MB 8 GB	256 MB 8 GB	256 MB 16 GB
External Cache	512 KB	256 KB on-die write-back	512 KB/ 256 KB	256 KB on-die write-back	512 KB/1 MB/ 2 MB	512 KB/1 MB/ 2 MB	512 KB/1 MB/ 2 MB	1 MB or 2 MB
NIC	yes	yes	yes (bundled)	yes	yes (bundled)	yes	yes	no
Redundant NIC Support	yes	yes	yes	yes	yes	yes	yes	yes
Rack Size	5u racked horizontally	5u rack- optimized (LC 2000r)	2u rack- optimized	8u rack- optimized (LH 3000r)	8u rack- optimized (LH 4r)	8u rack- optimized	4u rack- optimized	7u rack- optimized
Power Supply	256W continuous	250W continuous	200W continuous	550W continuous hot-swap	810W continuous; hot-swap	733W continuous (3 bricks)	550W continuous (2 bricks)	1500W continuous
Redundant Power Supply (RPS)	no	optional	no	2 hot-swap standard, 2 + 1 RPS optional; with dual cards	3 RPS (hot-swap) standard, 1 optional; with dual cords	3 hot-swap standard, 3 + 1 RPS optional; with dual cords	2 + 1 hot-swap RPS standard; with 3 cords	2 + 1 hot-swap RPS standard
Pricing (approximations)	\$1,500	\$2,300-\$2,400	\$3,500-\$4,000	\$3,500	—	\$7,300	\$8,200	\$19,000-\$20,000

Starting with the LC 2000, servers offer optional HP One-Button Disaster Recovery with optional HP SureStore DAT or DLT drives; HP NetServer Assured Availability solutions, MS Cluster certified. The LH 3000 offers an integrated dual-channel HP NetRAID Controller, hot-plug PCI slots, hot-plug drive bays, and redundant power supplies.

Table 1: HP NetServer Models and Specifications

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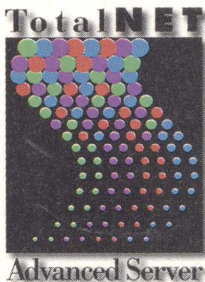


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The Competition

While HP's NetServers are chalking up sales in the Intel-based server space, HP's competitors, like IBM, Compaq and Dell, aren't standing still. All have introduced, or plan to introduce, servers featuring the new Intel 700-MHz Xeons with integrated cache on die. IBM has introduced a high-end server powered by the new 700-MHz Xeons. And Big Blue claims its new server shatters the data warehousing performance of HP UNIX-based V-Class servers and is priced at half the cost. In any case, HP's competitors continue to roll out new products.

IBM

IBM's new 64-processor NUMA-Q E410 may be, as the company claims, "the largest, highest performance Intel server available," but IBM's main challenge to HP in the Intel-based server market is the Netfinity line of boxes. At the same time it introduced the new high-end server, IBM also launched a new entry-level server in the Netfinity line, the Netfinity 3500 M20. Targeted at small and medium-sized businesses, the 3500 features the new 800-MHz Pentium processors, high-speed I/O, and 64-bit PCI, all elements designed to improve the performance of applications for Web serving, databases, e-mail and messaging. The 3500 M20 boasts an appealing price tag. Pricing starts at \$1,830.

Responding to the demand for rack-optimized boxes, IBM announced two rack-optimized models in the Netfinity line – the 4500R and 6000R. The 4500R has a 3u form factor and supports up to two 866-MHz Pentium III processors, up to 4 GB of memory, and 218 GB of storage. Pricing starts at \$3,700.

The 6000r, a 4u box, supports up to four 700-MHz Pentium III Xeon processors, offers 2 MB cache, and features 16 GB of memory. The server has up to three front-accessible power supplies along with a feature that prompts administrators to add a third power supply when needed. Pricing starts at \$6,999. Whereas IBM's older Netfinity 5500 M20 competed head-on with HP's NetServer LH4, the new Netfinity 6000r will compete directly with HP's 4-way/6-way LT 6000r.

Compaq

Earlier this year, Compaq rebranded its ProLiant line of Intel-based servers, mainly to attract service providers. In the rebranding, Compaq simplified the ProLiant line by renaming packaged clustering solutions with the tag CL, servers with maximum internal system expansion capability with the tag ML, and density-optimized systems with DL. The company also changed the numbers assigned to specific servers.

Following up on the rebranding, Compaq unveiled a retooled ProLiant ML530 to replace the ProLiant 3000 family of servers. The enterprise server, designed for applications and Web serving, supports up to two 800-MHz Pentium III Xeons. The ML530 is expandable to 8 hot-pluggable PCI slots. Pricing starts at \$14,809.

Compaq unveiled its newest server in the ProLiant line – the ML330, designed for the file/print applications in small and medium-size businesses. The ML330 supports Pentium III processors up to 866-MHz, up to 2 GB of memory, and 64-bit PCI slots.

The ML330 is the first server to feature the new streamlined ProLiant design, a look that will be featured in servers Compaq is introducing later this year.

Dell

Dell, too, jumped wholeheartedly into the rack-optimized arena early this year by introducing a PowerEdge 2450. The 2450 was one of the first servers to ship with Intel's 2-way 800-MHz Xeon processors. Pricing for the PowerEdge 2450 starts at \$2,999.

At the same time, Dell introduced its PowerEdge 4400 server, another 2-way box featuring 800-MHz Pentium III Xeons. Like the 2450, the 4400 features 133-MHz front-side bus technology that makes use of chipsets from RCC. Pricing for the 4400, available in tower and rack-optimized models, starts at \$4,699.

Dell grabbed industry attention when it unveiled the PowerEdge 2400, a workgroup server, and the PowerEdge 4400, a departmental server. The 2-way 2400 features 667-MHz Pentium III processors and up to 2 GB of memory. The 2400 received high marks for performance, mainly because of the combination of the 667-MHz processors and 133-MHz front-side bus. Pricing for the server begins at \$10,858.

The new PowerEdge 4400 is a 2-way server with 733-MHz Pentium III processors and 1 GB of SDRAM. It features hot-swappable power supplies and peripherals, like video and RAID controllers and an Intel Pro/100 + NIC, integrated onto the motherboard. Pricing for the PowerEdge 4400 starts at \$4,699.

– J.N.

means HP "offers customers up to 90 percent of the performance of an 8-way system at a 4-way price," Mari Young, Product Marketing Manager in HP's Network Server Division, said when introducing the new boxes. Young backed up her claim that HP's newest NetServers "offer an awesome value proposition" by pointing out that the traditional 8-way NT server carries a price tag of \$30,000. "That means customers pay about \$5,000 more for a 6-way than for the typical 4-way and receive 32 percent higher performance – not a bad price point," Young said.

Of course, prices for the 6000s start much lower than this – \$7,299 for the LH 6000 and \$8,199 for the LT 6000r.

In introducing the 6000, HP publicized a number of independent benchmarks that show the 6000s outperforming the Compaq ProLiant 6400 and the Sun Enterprise 450. According to these benchmarks, the 6000 equals or betters the performance of the ProLiant 6400 in a 4-way configuration and outperforms it by 20 to 50 percent in a 6-way configuration. HP's comparison with the Enterprise 450 are startling. Benchmarks show the 6000 performing the Sun machine from 30 to 80 percent in a 4-way configuration and from 60 percent to more than 200 percent in a 6-way configuration.

In addition to touting the price/performance of the 6000, HP boasts that the machine is easy to upgrade and service. Current users of HP's NetServer LH 3000 systems will have little problem upgrading to the NetServer LH 6000. Since the 3000 and 6000 share the same chassis and the same memory, drive and disk array controllers, LH 3000 customers can upgrade simply by installing a new motherboard and paying the price delta between the old and new systems. The motherboard slides right out of the 6000 to offer a toolless upgrade and facilitate servicing of the system.

In the LT 6000r, a rack-optimized model, the server snaps onto a slide that operates like a drawer, allowing customers to slide the server in and out of the system. The elimination of screws and other hardware often found in rack-mounted servers allows for easy and fast servicing.

The 6000 is expandable to 8 GB of memory and offers up to 8 free PCI slots, up to 4 hot-pluggable redundant power supplies, and up to 216 GB of internal storage. It also features an inte-

HP WORLD 2000

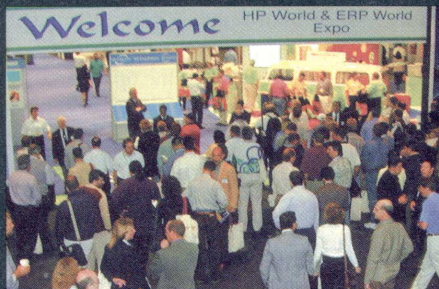
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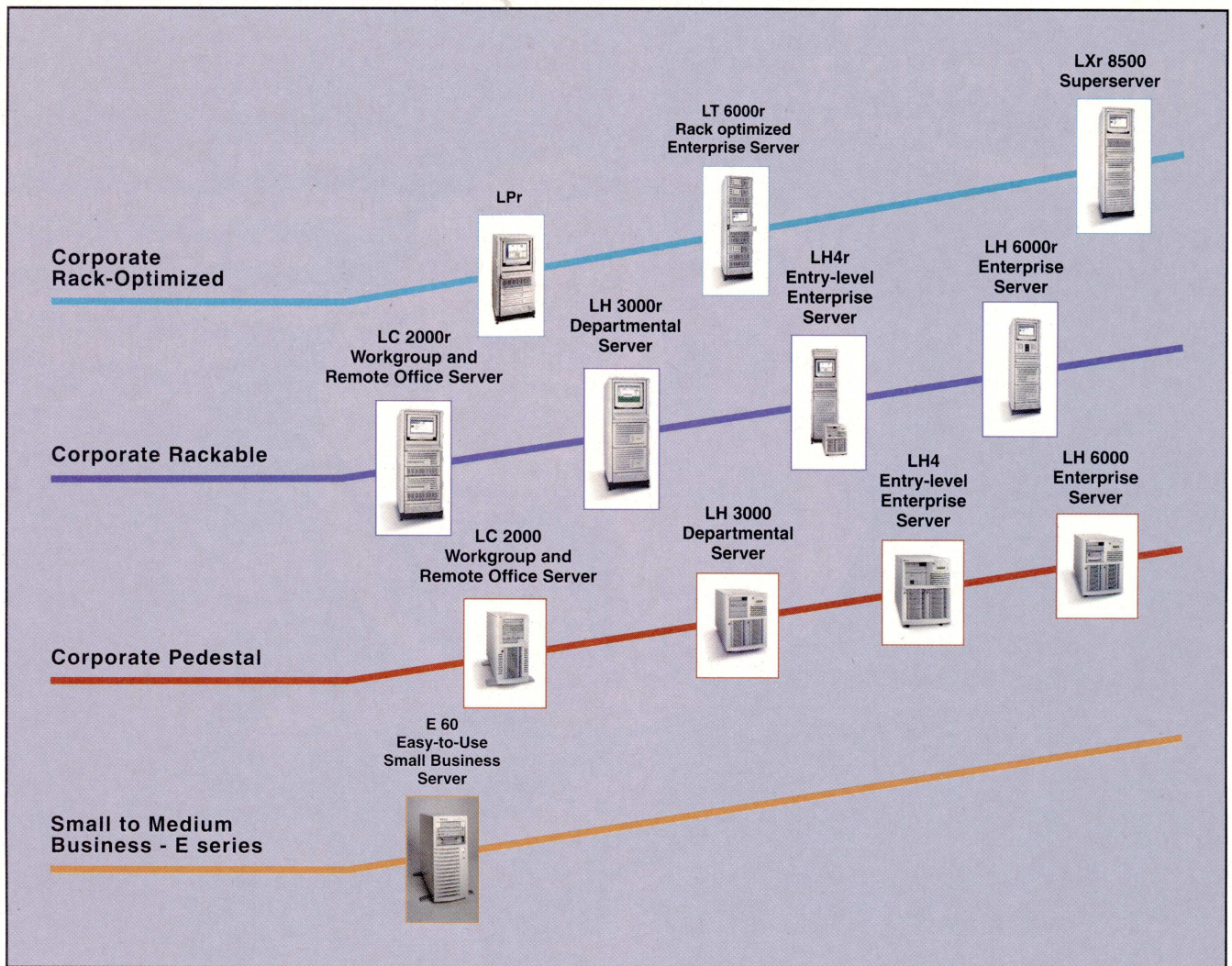


Figure 1: HP's NetServer Line – HP's Intel-based servers range from the low-end E 60 to the 8-way LXr 8500, but the machine that has become the flagship of the line is the LT 6000r, a 4-way/6-way rack-optimized, high-performance server for the midrange.

grated dual-channel HP NetRAID Controller at no extra cost.

The rack-optimized LT 6000r is packaged in a 4u form factor, allowing users to squeeze 60 Xeon processors into a 2-meter rack. The LT 6000r has received a lot of attention in the marketplace, winning Best of Show at NetWorld+Interop 2000.

THE LXr 8500

What HP calls its "superserver," the LXr 8500, supports up to eight 800-MHz Pentium III Xeon processors and up to 16 GB of memory, and boasts all of the high availability features of the midrange boxes. Pricing starts at about \$19,000 or \$20,000.

HP is seeing "a lot more interest in the 8-way machine in the last four to five months," according to Bennett, who credits Windows 2000 for the growing attention. "My guess is that the scalability of

Win 2000 has added credibility to the 8-way space," he says.

WHAT'S IN STORE FOR THE NETSERVER LINE?

Asked about HP's plans for the future, Bennett mentions one "big development" – Itanium-based machines at the high end of the NetServer line. "When Intel releases the Itanium in the second half of this year, HP will be right there," he says. While Bennett refuses to be specific about dates and machines, he does reveal that HP will release Itanium-based NetServers in the second half of this year.

Then there are Intel's new 700-MHz chips with integrated cache on die. HP has already introduced 6000s and 8500s with these new chips and in August will roll out a 4000 featuring them. Users can expect a big performance boost because of architec-

tural changes in these processors – the placement of cache on the chip. Bennett cites performance improvements of up to 45 percent. One caution, though, availability of the chips is very tight.

Bennett also says to look for HP to unveil more rack-optimized products at the low end. The products will cover a wide range of price points, capability and form factors, he says. This doesn't mean that HP expects to introduce brand-new servers. It plans simply to refine different models in its product line and give users the opportunity to migrate to next-generation processor technology. ♦

– Jean Nattkemper is the Editor at Large for HP Professional. She can be reached at jnattkemper@hpro.com.



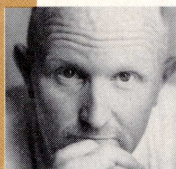
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Three Views on OpenView

Jean Nattkemper

Enterprise system management is such a hot topic, and HP OpenView such a dominant player in this space, that third-party vendors are integrating their products with OpenView, extending its functionality. Agilent Technologies, OPNET Technologies and Network Appliance are among the vendors that have recently introduced new, integrated solutions.

Agilent, formerly a division of HP, offers Firehunter, which is not a system management product per se, but service assurance software that offers a view of the enterprise different from that provided by OpenView. By integrating tightly with OpenView, it opens up an entirely new dimension of management to IT professionals. OPNET and Network Appliance offer software that integrates predictive management and storage management capabilities, respectively, with OpenView.

Firehunter: Managing Internet Services

While OpenView provides a topological view of the environment for ISPs and large enterprises, Firehunter/Pro, a former HP product and now owned by Agilent Technologies, provides a service view. Firehunter/Pro has been enhanced with a new e-commerce application that provides continuous realtime monitoring of e-commerce site performance. Firehunter/Pro monitors basic Internet services, such as

e-mail Web service, news, and so on, while Firehunter/e-Commerce extends those capabilities to monitor Internet services for business relying on e-commerce. "We're expanding beyond ISPs to embrace all the dotcoms," says Larry Robinson, Senior Product Manager for Agilent's Firehunter Business.

Although Firehunter works with system management software other than OpenView, it is integrated tightly with OpenView Network Node Manager, allowing for easy navigation between the products. "When Firehunter detects a service level fault as seen by the customer, it can launch right into OpenView Node Manager, which can drill right down to the router, or component level," Robinson explains. "[German auto maker] BMW, for example, uses OpenView for system management and has adopted Firehunter for Internet services management, in this case, e-mail management."

Agilent touts the new Firehunter/e-Commerce as the first solution that allows ISPs hosting electronic business-to-consumer storefronts to continuously monitor performance of the entire infrastructure that supports e-commerce. Robinson says the new release offers three key features. It monitors from the top down – meaning



from the customer down. It monitors infrastructure performance by monitoring the components behind the firewall in the service delivery channel. And it displays the performance of e-commerce sites in terms most helpful to users.

MONITORING IN REALTIME

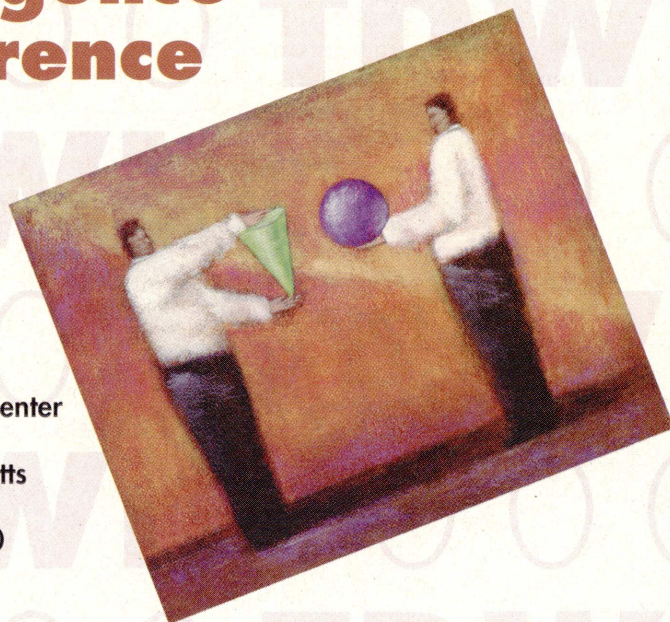
In operating from the top down, Firehunter/e-Commerce monitors the front-end through transaction tests. It uses synthetic transactions, records all the steps in the transaction, and plays the steps back as a test against the system.

Take, for example, a site selling printers (see Figure 1 on page 22). Firehunter/e-Commerce monitors the transactions in realtime, showing information on the number of people accessing the site, the number searching for printers, the number of printers in shopping carts, and the transactions involving financing and search. It uses color-coded icons to display the information and every five minutes, the user can view specific transactions to detect where performance



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is slow. That allows e-commerce sites to catch performance problems before they occur and isolate them quickly, because, as Robinson says, "A delay of eight to 10 seconds means a lost sale."

Competitors use synthetic testing mechanisms that are directly linked to a page. That means whenever the page changes – and that could be several times a day – the test changes. Firehunter/e-Commerce, on the other hand, allows users to go back and rerun synthetic tests to detect changes in pages. "Tests," he says, "are always in synch with the content."

Besides monitoring from the top down, the software links to the infrastructure. Although the user sees the front end, behind that are "a whole bunch of other systems," Robinson points out. These include the network, servers, database accesses, and so on, that are part of the service delivery channel. "We provide a realtime portrayal of response times," Robinson says. "When things start to slow down, service providers can see where problems are occurring and avoid catastrophic occurrences." Firehunter/e-Commerce also links the infrastructure to the

user experience by providing information users need, such as authorized sales rates, dollar rates of new order and dollar rates of declines. Users can then compare transaction rates say, at 9:55 a.m. on Tuesday with rates at 9:55 a.m. the following Tuesday.

The new application is a 70 percent out-of-the-box solution. "It gets ISPs and enterprises up and running fast," Robinson says. But it can also be adapted to the different suites of software running on big e-commerce sites. Built to the BroadVision architecture, Firehunter/e-Commerce can be customized for offerings from Microsoft, IBM, and others. Firehunter/e-Commerce runs on UNIX (including Solaris and HP-UX), Windows NT and will support Linux in its second release, scheduled for the second half of this year. Firehunter/Pro already operates on Linux.

IT DecisionGuru: Predictive Management

OPNET Technologies develops modeling and predictive network solutions that provide forward-looking visibility into the design and implementation of the network infrastructure. This allows IT managers to determine whether the infrastructure will support either existing or proposed service level agreements (SLAs). By using the software, IT managers can predict what will happen if a new application is brought on board. How will the new application affect the network load? Will it affect existing SLAs, transforming them from a current state of compliance into a state of violation?

"Our solution is highly complementary to the rest of the OpenView solution set," says Steve Johnson, Vice President of Strategic Marketing for OPNET. "We have a very deep level of integration by taking the real-world topology information of the network infrastructure that comes out of OpenView [information on network interconnections and network devices], and we use that information by connecting directly to the OpenView server.

"Then we bring in the information to establish what we call the baseline model of the infrastructure. At this point, IT managers

have a mirror image of the production environment. And they can begin to make modifications to explore what-if scenarios to determine the effect on overall application performance if they were to, for example, increase of the capacity of the links among various remote offices. Or they could explore changing from a frame relay technology and moving to a higher capacity ATM backbone and the effect that would have. They could also explore whether such a move would be cost-effective. Would they see a good return on their investment in the new technology?"

OPNET's customers for IT DecisionGuru are both enterprises and service providers, with the customer base split evenly between the two. But Johnson says the number of service provider customers is growing rapidly. And OPNET is, he says, introducing more and more capabilities to enable service providers, especially ASPs, to deliver IP-based services with a concentrated focus on the performance of an individual application. In fact, OPNET just released a solution for the service provider arena – Version 7.0 of IT DecisionGuru.

DIAGNOSIS OF PROBLEMS

IT DecisionGuru Version 7.0 boasts several new features, including AppDoctor (see Figure 2 on page 23). AppDoctor takes IT DecisionGuru a step further by automating the interpretation of performance data and providing synthesized results. Previous versions of the software provided information on performance, which users then analyzed. AppDoctor provides automated diagnosis, as well as guidance, or suggestions, on the root cause of performance problems.

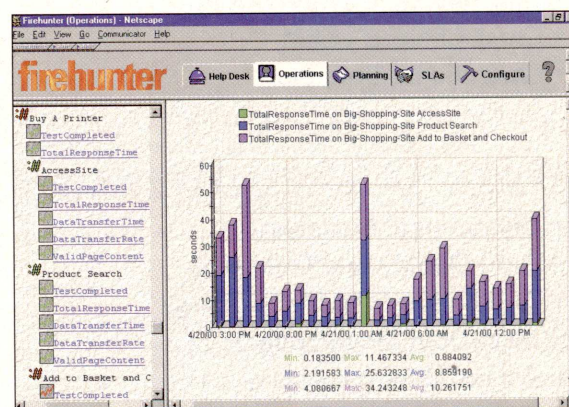


Figure 1: Firehunter/e-Commerce shows total and specific response times for each step in the buying process for an e-commerce site selling printers.



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Version 7.0 also aligns IT DecisionGuru with what Johnson calls “a new wave of technology” – wireless. The software now boasts increased capabilities that extend its usefulness beyond the wired network to offer the same kinds of predictive analysis for both wireless and wireline types of networks.

Because of increasing interest in another relatively new arena – what Johnson calls “the known quality of service levels” – IT DecisionGuru 7.0 allows IT managers to perform predictive analysis in the context of QoS mechanisms. “In many cases the routers and many other devices within the network have certain QoS protocols engaged to guarantee delivery of certain kinds of application traffic with a priority,” Johnson explains. “That priority is now accounted for within the OPNET environment. Things like voice-over IP must be assigned a higher priority than e-mail, for example. IT DecisionGuru now provides information not only on how protocol implementations affect performance of time-sensitive or delay-sensitive applications, like voice or video, but forecasts what happens when the IT manager enables a QoS mechanism within the infrastructure. In other words, the software analyzes how that will affect applications that don’t have a delay issue, like e-mail or the Web. It determines whether the Web will become very, very slow because you’ve turned on QoS to accommodate voice or whether the SLA for your ERP application will suddenly become non-compliant.”

A NEW MODULE

OPNET recently released a new module for IT DecisionGuru – Application Characterization Environment (ACE). ACE allows users to import application traces from leading network analyzers, like Network Associates’ Sniffer, for example, and then to break down multitier transactions, such as Web-based order entry, and provide a graphical representation of client, network and server interactions. IT DecisionGuru can then simulate the future performance of the application when deployed. That allows IT managers and application developers to isolate the sources of potential performance bottlenecks and verify whether the corrective actions they plan to take will actually correct the problem.

To demonstrate how ACE can forestall missteps, Johnson refers to an unnamed company he will identify only as a “large computer manufacturer in the U.S.” Faced with a slow application involving the exchange of information between the United States and somewhere in the Asia Pacific, the company’s first reaction was to point to the network. Why not increase bandwidth by upgrading the intercontinental circuits? But, then the company found the network wasn’t the problem after all. ACE discovered that the TCP parameters were configured incorrectly. As a result, the exchange of information was being throttled. According to Johnson, “The OPNET solution allowed the company to identify the root cause of the performance issue and make modifications to the TCP parameters. This company spent zero dollars and ultimately got a substantial increase in performance.”

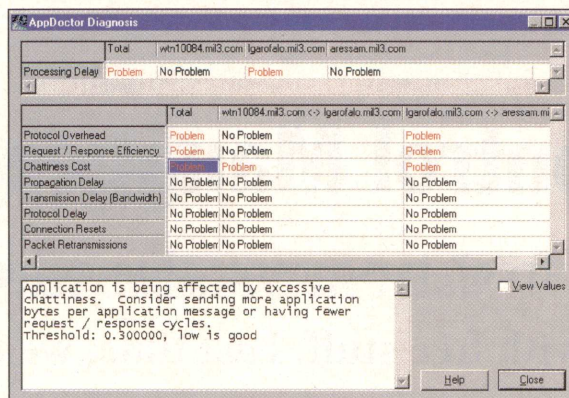


Figure 2: AppDoctor automates interpretation and provides synthesized results on performance problems in the network.

ApplianceWatch: Managing Storage Applications

With storage management such a hot issue, the market is seeing more and more products that allow IT managers to manage data from a central location or single point of control. One new solution consists of a family of products from Network Appliance, a provider of NAS (Network Attached Storage) devices.

Network Appliance’s Appliance-Watch family of products aims to offer companies investment protection by allowing them to manage NetApp files and NetCache appli-

ances through existing system management tools. Network Appliance chose HP OpenView as the first system and network management framework with which to integrate its new products.

The integration of ApplianceWatch with HP OpenView allows companies to deploy the Network Appliance products in an existing OpenView environment. “Before, companies with a central management policy in place with their administrators had more trouble finding where problems were,” says Dave Becker, Manager of Strategic Alliances in the Systems Management Group at Network Appliance. “The integration allows users to bring Network

See OpenView on page 28

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Service Control Manager

Since “good stuff free” is so rare, this column (just like last month’s) will deal with free stuff. Last time, we covered the System Configuration Repository (SCR). This month is about another free

product from HP named Service Control Manager (SCM). SCM is a role-based system management service. You could say it is `remsh`, `sudo`, `rdist`, `shutdown.allow`, `SAM`, and all the other “setuserid”-type tools rolled into one. What HP means by a “role-based” mechanism, is that an administrator is often responsible for only a certain part of administration in the network. For example, someone might be responsible for creating and maintaining users, another for ensuring backups, and yet another for monitoring performance or availability of Web servers. You might say that to perform a certain administrative role, a person would require a set of commands and programs (call them tools). In other words, in SCM, a role is a set of tools for which you can grant a person execution access against a set of hosts. What is nice about this tool is that you can define the roles by assigning tools to them, make select persons members of any “role,” and authorize a person to perform a role against a host, or group of hosts. There are some built-in tools, for Ignite-UX, SD-UX, system recovery, SAM and some system information gathering. You can also build tools fairly easily, and make them part of the SCM system.

SCM OVERVIEW

SCM is meant to make administration of multiple machines:

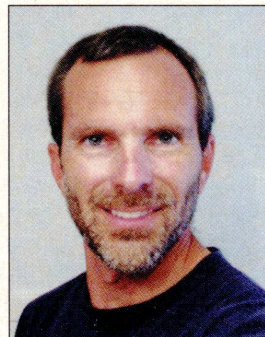
- *Simpler* – Perform the same task against multiple hosts at once
- *More Efficient* – Execute a task in parallel across a group of hosts
- *More Secure* – Everyone that performs administration tasks does not need root access
- *Consistent* – Copy files to, and make changes to, a group of hosts at once to ensure configuration consistence

In order to ensure this, HP has based SCM on a “master” central management server, called the CMS in documentation. The CMS must be running HP-UX 11 in order to install the SCM software. It does not have to be dedicated, since it uses little system resource when you are not performing admin tasks. All task, tool, logs and authorization information is saved on the CMS. This is called the repository. The CMS will probably also be an SD-UX software depot if you plan to use SCM to distribute updates or patches (or Ignite machines). This means that there will be some disk space requirements on the CMS.

All tasks are invoked by running SCM on the CMS. This can be done remotely with the command line interface, remote X display, or using the Web interface, if you set up a Web server on the CMS. Multiple tasks can be launched at once through one SCM session. There are some limitations on how many can be invoked at once, especially in version 1.0, until impacts are better sorted out.

Any host that you want to manage with SCM must have the SCM agent SD software loaded, and an “add host” step performed on the CMS. Loading the SCM “managed host” software installs the Distributed Task Facility (DTF) agent on the host (and other required software). The CMS machine runs a DTF Daemon that initiates, controls and logs tasks. The managed hosts’ DTF agent performs any file copies configured into a task on a pull basis, and does the actual execution of any commands in a task. There are other agents required if you

want SCM to perform system configuration repository duties (Scragent), SD-UX pushes (Sdagent) or Event Monitoring Service (EMSagent).



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USAGE DETAILS

First off, whenever SCM documentation mentions a user, they are referring to a standard `passwd` type login name. This is a good thing, meaning you don’t have to setup additional names for users; logging into HP-UX does all authentication required by SCM (in other words, SCM uses your UID to determine privileges and

authorizations).

Before using SCM, you will probably do most of the following things: Add users, add tools, create roles, configure authorizations and add hosts. Together these steps combine users, tasks and hosts into groups of related tasks, to be performed by certain users, on specific hosts.

There are several tools that exist in SCM when installed. To add new tools, you can create text files (Tool Definition File) that describe them, using supplied tools as templates, or do so in the SCM GUI. A newly added tool will be assigned to the role of “Master Role.” You can have up to 16 roles, but “Master Role” must be one of them, so really there are 15 available for limited user configurations at version 1.0 (it is likely that only root password holders will be in the master role). Roles can also be disabled and enabled, as needed, such as for consultants. Tools can copy up to 16 files to the target before execution. A tool can be a script, command or application to be executed, or just copy files. It could also copy

See HP-UX on page 32

Help Utilities for Win NT and 2000

Winternals Software has bundled some of its most popular NT/2000 utilities into the Administrator's Pak. This set of utilities is an excellent collection that most administrators of NT

or Win 2000 systems will find very useful. The Administrator's Pak consists of nine programs. I'll look at a few of them now and the rest in next month's column.

FileMon and RegMon are tools to monitor the file system and registry of any Win 2000 system on the network. The utilities consist of a monitoring program and a client program. The client can be installed on any machine on the network.

The monitoring program is then used to connect either to the local machine or to a machine running the client software via TCP/IP. Once the monitoring program is running, any and all activity on the target systems is recorded, not just changes. This is really useful for seeing what particular programs are doing. For instance, when starting Internet Explorer, my system logged 1,648 separate accesses of the registry. Each phase of the access to the registry was recorded.

Because of the sheer amount of data being logged, the monitoring programs offer good searching and filtering tools. The search tool will look for a particular string in the log and the filter tool will pare down the log to include or exclude particular entries. For instance, you can include every change to the registry except those made by explorer.exe (MS Internet Explorer). Since many programs save their states to the registry when exiting, this can allow you to build a filter that will just show changes made by certain programs. This is useful for debugging code under development. You can also use the filter feature to

highlight particular entries in the color of your choice, allowing you to zero in on relevant entries with a quick glimpse of the log. The programs will log entries to screen, disk or both.

Both programs have some unique features. RegMon features a registry jump that allows you to highlight a log entry, then jump to the Registry Editor and automatically select the registry key in question. If you find a key that has been changed in error, you can jump directly to the key and fix it.

Similarly, FileMon has an Explorer jump which uses NT Explorer to locate the file in question. FileMon offers options to log activity on all or only certain drives. It also can log activity to the disk by name of system calls (FASTIO_READ) or in a more user-friendly format (READ).

NT Recover is used to gain access to systems that fail to boot. It consists of a host and client arrangement. The client is the dead system. NT Recover creates a boot disk with the client program. Your client program can even use a DOS startup disk with drivers necessary for accessing special devices. To recover a dead system, connect the dead system and a functioning system together via a serial cable. Boot the client (the dead system) with the client disk. The host (the good system) then accesses the client via the serial cable, and mounts the client system disk with a drive letter. After the client is mounted, you can use check disk, explorer or any other utility on the client. Even if you can't get the dead system running again, you can

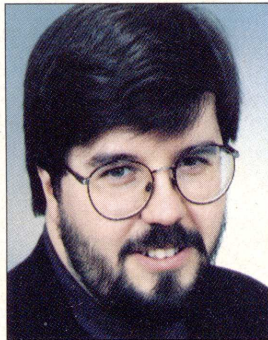
copy files to the good system and use them on a new or rebuilt system.

NT Locksmith is an add-on to NT Recover. It allows access to a system when the administrator's password has been lost. The program uses the connection established by NT Recover to access the machine you can't log in to, navigate to the drive of the remote machine and change the password. The attributes of the administrator account are preserved and nothing else appears to be affected. This is very useful for pesky workstation users who change their passwords and promptly forget.

BlueSave is designed to save the infamous Blue Screen of Death (BSOD) information that appears when a serious hardware or software error causes NT to crash. It's the only software in the Administrator's Pak that works exclusively under NT 4.0, since the BSOD is not a part of Win 2000. The program installs quickly and simply sits waiting for a BSOD to occur. When it does, a message appears on the BSOD saying that BlueSave has written the screen contents to a file. The file is called BLUESCRN.TXT and placed in the system root directory, usually \WINNT. That's it. If your system doesn't boot after the crash, you can use NT Recover to get the file. If necessary, the file can be e-mailed to Microsoft support and you can get your machine running again.

The programs are small (delivered on a floppy disk, of all things) and feature very straightforward interfaces. The help files actually help and feature step by step instructions on how to use the software.

Pricing for the Administrator's Pak is \$699 and is available from Winternals Software LP (800) 408-8415; or visit www.winternals.com. ♦



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Phoenix Program Extends the Life of the HP e3000

Not long ago, my sources told me I ought to look into the Phoenix 3000 program run by Client Systems. The program involves testing and refurbishing worn components within an HP e3000 so that it can be warranted like new, but not at the new price. It sounded intriguing, so I decided to investigate. To get the straight skinny, I made contact with a

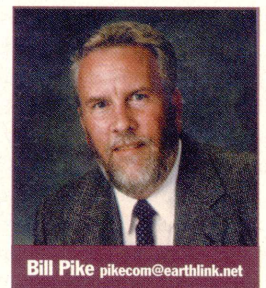
customer reference given to me by Client Systems. I contacted Steve Quinn, Vice President of eXegeSys Inc., a Salt Lake City software company.

After explaining why I was calling, Quinn told me, "I'm the person you need to talk to." He went on to explain his relationship with Phoenix 3000. "We recently purchased a Phoenix 3000 through Client Systems for our R&D organization. So, I know firsthand how the program works."

As Quinn continued, I learned that the R&D acquisition was not the only reason or connection the firm had with the Phoenix 3000 program. eXegeSys packages its ERP software as a complete business solution. This can cause the company to act as a VAR, and it relies on the HP e3000 as the system of choice when a package is being put together for its clients.

"The hardware component is not a simple decision, certainly," Quinn explains. "When we are sizing an HP e3000 machine for one of our clients, that is when we decide what machine and options will be needed to best do the job. Our customer may raise a concern about

hardware pricing. Our focus is primarily on the client's potential growth and, of course, the growth of the application, as well as the longevity of the machine. In other words, the features need to match our client's needs. When it comes to price points, the Phoenix 3000 can be a viable option that we are comfortable recommending."



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HP'S VIEW OF THE PHOENIX 3000

Loretta Li-Sevilla, the Worldwide Solutions Marketing Manager for the HP e3000, got right to the point when I called and asked for her opinion on the Phoenix program. "Phoenix is a value because it belongs to one of our HP partners, and the program plays a role in extending the life span of the HP e3000. We are very supportive of the Phoenix program."

According to Li-Sevilla, the machines are cycled through as part of HP's trade-up process. "We have visited and continue to walk through the facility where the HP e3000 machines are in the process of being reconditioned. It is important to keep in mind that HP's product reputation is also at stake, and we want to be sure that the reconditioning program retains a very high level of quality. It is a good partnership, and I am pleased with the relationship."

According to Sean McCloskey, Business Development Manager for the Phoenix 3000 with Client Systems, HP's commitment to these servers over the long haul has helped make the Phoenix program possible. "The HP e3000 is a rugged and reli-

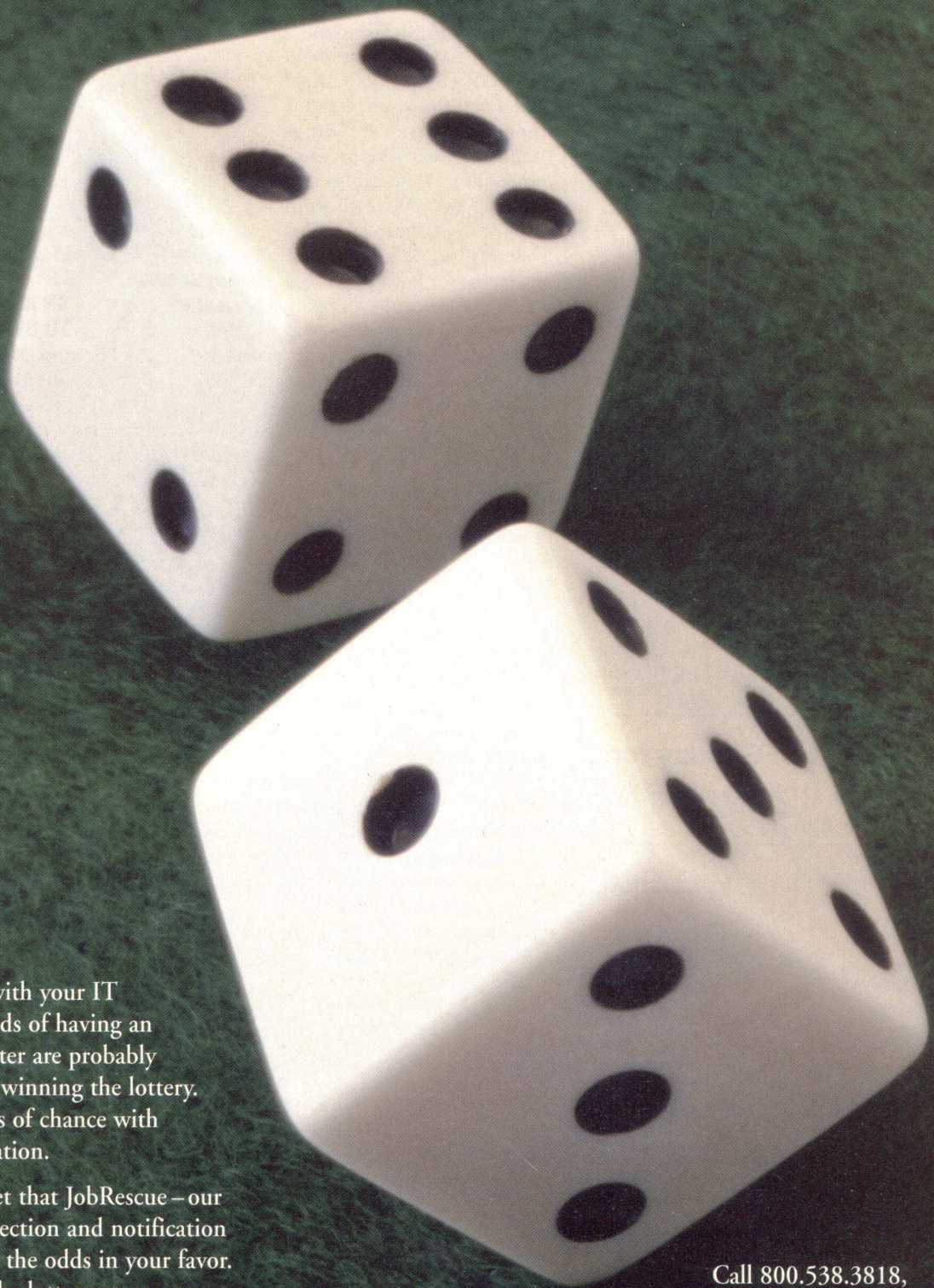
eXegeSys Inc. Fills a Software Niche

HP originally developed its Manufacturing Management II (MMII) software on the principle that upgrades should be made without great expense and without disrupting a business' normal operations. HP marketed the software successfully for 10 years, building a strong customer base and ranking in the top five best business application solutions in leading manufacturing systems magazines. However, in 1992, HP shifted its business focus from a solutions provider to a platform provider. Paul Dorius and Steve Quinn both recognized the shift in HP's focus as an entrepreneurial window of opportunity.

eXegeSys was formed to fill the niche that HP was leaving open. Dorius and Quinn, both former HP employees, founded eXegeSys in 1994, with a \$1,000 initial investment to promote and perfect a business software solution developed by HP.

Today, the firm is the worldwide licensor of the product. The name of the software was changed to eXegetic Resource Planning (eRP) to reflect the change in ownership and the revitalization, expansion and future of the product. For more information, visit eXegeSys at www.exegeSys.com.

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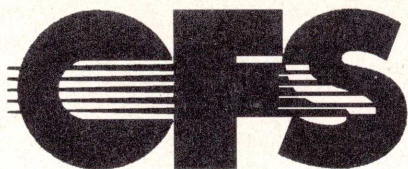
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able server, and it is tough enough to stand being refurbished and reconfigured. HP's commitment has enabled the continued procurement of parts."

It is very difficult to tell a Phoenix server from a brand new HP e3000. The sheet metal is steam-cleaned and is repainted with the dings removed, just like an auto body shop. New cables and internal gear replace all worn parts. The documentation that supports the MPE license, the manuals, etc., are all packaged and included in the shipping carton. "... things that are typically lost in the used computer market are always included with the Phoenix 3000 package," McCloskey explains.

An interesting pattern of use has occurred when it comes to acquiring a Phoenix 3000 for a limited period of time. While Client Systems would prefer to sell the Phoenix 3000s, they also offer several rental and leasing options.

As Mike Murphy, Vice President and General Manager for Client Systems

explains, "People have acquired the server for a year, a few months, sometimes for an even shorter period of time. This happens when a company is about to move to a new location; or, perhaps, is reorganizing its server farm; or is engaged in testing a beta version of a new application. An investment in new infrastructure or top of the line equipment makes no sense, but the price points of a Phoenix 3000 make it a cost-effective choice."



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The Phoenix 3000 program offers a creative and affordable way to fill a need. Because it is a specialized approach, it may not be for everyone. But, when an organization needs a server with the horsepower of an HP e3000, yet the budget won't allow a purchase this fiscal year, the Phoenix program can become an attractive alternative. For more information about the Client Systems' Phoenix program, visit www.phoenix3000.com. ♦

OpenView *Continued from page 23*

Appliance products into the same policies and governing practices they apply in their infrastructures."

Network Appliance offers multiprotocol NAS devices that allow users to communicate to a central source for their data in their data languages. That means appliance and client applications can make use of NetApp filers from anywhere on the network and access data via the appropriate file protocol – HTTP for the Web, NFS for UNIX, and CIFS for Windows.

"Companies now have in their data centers rack-mountable environments that must scale quickly," Becker says. "We provide scalability of capacity for those environments, scaling from roughly 200 GB all the way up to about 1.5 TB for a single system."

"Here's where OpenView and Network Appliance come together ... In the customer environment, the need is to be able to manage and maintain the cost of administration as the number of units scales," Becker explains. "With ApplianceWatch, users can scale the number of systems they manage under the auspices of HP OpenView, which allows them to monitor the events related to our filer and

caching products from a central console. That keeps administrative costs down. And our filers and net cache products can be seen right there at the network operations center."

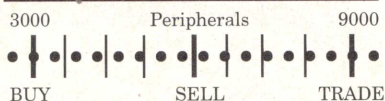
The integration of ApplianceWatch into OpenView works this way. If there's a problem with a filer, the filer does discovery and then allows the user to bring up Network Appliance's management tools. The responsibility of HP OpenView is to locate the problem and identify the machine experiencing the trouble. Then the system calls up NetApp FilerView, a Web-based management tool, to change the configuration of the filer or do whatever is necessary to solve the problem.

The ApplianceWatch products obviously are not for the small shop. They are designed for large enterprises and ISPs that buy a lot of infrastructure equipment. Some ISPs are deploying the products in caching structures at all the points of presence they want to monitor centrally. In fact, Becker says that nine out of the 10 top ISPs are Net Appliance customers.

ApplianceWatch for HP OpenView 1.0 is available now on Windows NT, Sun Solaris and HP-UX systems. ♦

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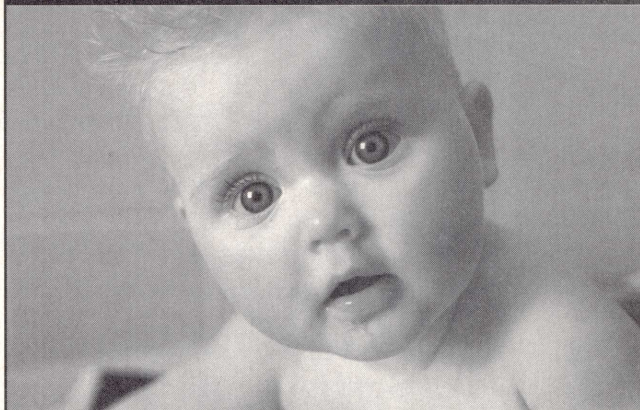
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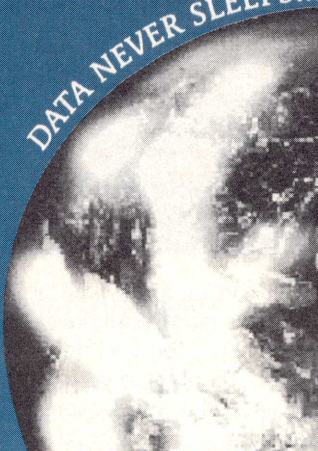
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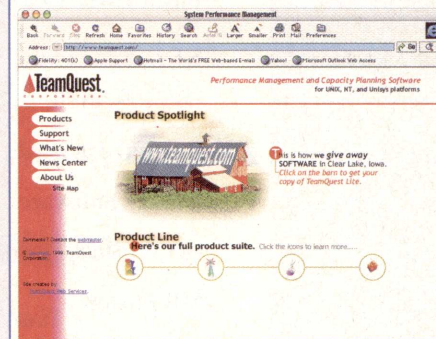
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files, then execute a command or script that uses those files. In some cases, different tools might require that options be changed when you run them. This is allowed under SCM. The tool definition language allows for supplying an optional set of arguments to the command line for a tool.

After a set of tools is created and assigned to roles, it is time to add the users that will be allowed to perform that role. You must be logged in as a privileged user to control SCM itself. You must also add hosts to the list of managed hosts. This must be done after the SCM agent software is loaded on the targeted host. Hosts can be grouped into administrative boundaries. Hosts might be grouped by person or department responsible, or it could be by related usage, to align with tools that need to be run on the machine.

The actual granting of rights to perform a role (actually the tasks or tools, assigned to a role) on a host is called authorization. You assign authorizations based on a user->role->host. It will typically take many authorizations to set up a set of managed hosts.

Executing a task can be done with the GUI, the Web interface to the GUI, or the command line, but only from the CMS. Some tasks will require user input, others can be automated.

Executing a task can be done with the GUI, the Web interface to the GUI, or the command line, but only from the CMS. Some tasks will require user input, others can be automated. The user running the task can specify which targets to apply it to. If they are not authorized for any host or task, the entire task fails. A user can specify output files, and monitor a task while it runs. Log files are stored in the repository so that you can look back and see what was performed. Additionally, even when a task must be run by root, the log

will indicate whom actually executed it. The `mxexec` command allows command line running of tasks.

LIMITATIONS

There are a few limitations. First off, at the time of this writing, version 1.0 was the most current that I could find. First versions are always scary. You may want to look and see if there are any patches while you download it. The second limitation is that at version 1, series 700s are not supported, so the tool is more for managing servers than end user hosts. There are also several limitations on a number of tasks, roles and concurrently running tasks. The indications I think I heard from the HP presentors of this subject at the Interworks conference was that these limitations might change in the future, but some actual customer feedback was needed before those decisions were made.

So, if you decide to try this product, be sure to pay HP back for their work by supplying some feedback on what you think of it. I suppose that makes it not quite a free product, but the price sure is right. ♦

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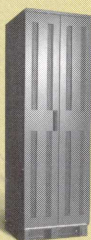
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